

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-4 and 6-71 are pending in the application, with claims 1, 9 and 42 being the independent claims. Support for the amendment to claim 1 can be found, for example, in original claim 1 and in the Specification from page 16, line 1 to page 17, line 22. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 112, First Paragraph— Lack of Written Description

Claims 1-4, 6-8 and 41 were rejected under 35 U.S.C. § 112, first paragraph, "as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention." *See* PTO File Wrapper Paper No. 16, p. 3, lines 12-15. In particular, the Examiner alleges that "the specification does not adequately describe that said denaturant is not selected from the group consisting of asparagine and β -alanine as recited in claims 1-4, 6-8 and 41." *Id.* at lines 17-19. Applicants respectfully disagree.

However, solely to expedite prosecution and not in acquiescence to the rejection, Applicants have amended claim 1 thereby rendering this aspect of the rejection moot. Applicants respectfully request that the Examiner reconsider and withdraw all written description rejections made under 35 U.S.C. § 112, First Paragraph.

Rejections under 35 U.S.C. § 112, First Paragraph— Enablement

Claims 1-4, 6-8 and 41 were rejected under 35 U.S.C. § 112, first paragraph, "because the specification . . . does not reasonably provide enablement for: (1) using any kind of amino acid at any kind of experimental condition as a denaturant to dissociate a double stranded DNA; and (2) using any kind of polyamino acids as a denaturant to dissociate a double stranded DNA." *See* PTO File Wrapper Paper No. 16, p. 4, lines 13-18. Applicants respectfully traverse the rejection.

The courts have indicated that the Examiner bears the initial burden of setting forth a *prima facie* case that the claims are not enabled by the Written Description:

As a matter of Patent Office practice, . . . a specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as in compliance with the enabling requirement of the first paragraph of § 112 unless there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support.

See In re Marzocchi, 439 F.2d 220, 223; 169 U.S.P.Q. 367, 370 (C.C.P.A. 1971) (*cf.*

M.P.E.P. (Eighth) § 2164.04 "Burden on the Examiner Under [t]he Enablement

Requirement" (2001)). Applicants respectfully argue that the Examiner has not set forth a *prima facie* showing of nonenablement.

In regards to enablement, Applicants' Written Description enables the skilled artisan as to how to identify amino acid or polyamino acid denaturants for practicing the claimed methodology without undue burden. The skilled artisan can readily determine those conditions which facilitate nucleic acid denaturation. The Specification indicates that this is easily determined by the skilled artisan and provides amino acid denaturant concentration ranges. *See* Specification, p. 16, lines 23-30. Moreover, further guidance is provided in Example 11: Assay for Determining Denaturation of Double-Stranded Nucleic Acid Molecules with Amino Acid Denaturants. *See* Specification, p. 39. Hence, Applicants' Specification enables the skilled artisan to identify amino acid and polyamino acid denaturants useful in the claimed methods. Accordingly, the Written Description enables the claims as drafted.

The Examiner has alleged that "there is no direction or guidance in the specification that any kind of amino acid at any kind of experimental condition and any kind of polyamino acids can serve as a denaturant to dissociate a double stranded DNA." *See* PTO File Wrapper Paper No. 16, p. 5, lines 5-7. This statement, however, does not sufficiently set forth a *prima facie* showing of nonenablement, especially in light of the above referenced passages of Applicants' Specification.

Applicants respectfully request that the Examiner reconsider and withdraw all enablement rejections made under 35 U.S.C. § 112, First Paragraph.

Rejections under 35 U.S.C. § 102(b)

Claims 1, 2 and 41 were rejected under 35 U.S.C. §102(b) "as being anticipated by Rees *et al.*, . . . as evidence[d] by Freifelder." *See* PTO File Wrapper Paper No. 16,

p. 7, lines 1-3. In particular, these references allegedly showed that betaine (N, N, N-trimethylglycine) "greatly sharpened the melting transition [of calf thymus DNA] and shifts it to a lower temperature." *Id.* at lines 4-7. Claims 1, 2, 4, 6-8 and 41 were also rejected under 35 U.S.C. §102(b) "as being anticipated by Aslanyan *et al.*" *See* PTO File Wrapper Paper No. 16, p. 8, lines 3-4. In particular, this reference is cited to allegedly show that "glycine concentration[s] with range[s] of 1 mM - 3000 mM . . . reduce the melting point of calf thymus DNA." *Id.* at lines 5-8. Applicants respectfully traverse the rejection.

Solely to expedite prosecution and not in acquiescence to these rejections, Applicants have amended claim 1 and submit the following remarks. Claim 1 is directed to a method for denaturing or separating double-stranded nucleic acid molecules, the method comprising i) contacting one or more double-stranded nucleic acid molecules with a denaturant selected from the group consisting of

- a) one or more amino acid denaturants,
- b) imidazole, and
- c) one or more amino acid denaturants plus imidazole,

thereby forming one or more single-stranded nucleic acid molecules; and ii) combining the one or more single-stranded nucleic acid molecules with one or more nucleic acid molecules wherein the one or more nucleic acid molecules are capable of hybridizing to the single-stranded nucleic acid molecules. At best, Aslanyan and Rees *et al.* as evidenced by Freifelder respectively disclose the effect that glycine or betaine has on the T_m (melting point) of DNA. These references do not anticipate or teach Applicants'

invention. Applicants respectfully request the Examiner to reconsider and withdraw all the rejections made under 35 U.S.C. §102(b).

Double Patenting Rejection

Claims 1-4, 6-8, and 41 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,268,133. *See* PTO File Wrapper Paper No. 16, p. 9, lines 10-12. Applicants thank the Examiner for pointing out that "[a] timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application." *Id.* at lines 3-6. Applicants respectfully traverse and request reconsideration and withdrawal of the Double Patenting Rejection. However, in the event that the Examiner is unwilling to reconsider and withdraw this rejection, Applicants respectfully request that the Examiner hold this Double Patenting Rejection in abeyance until all other rejections are withdrawn.

Conclusion

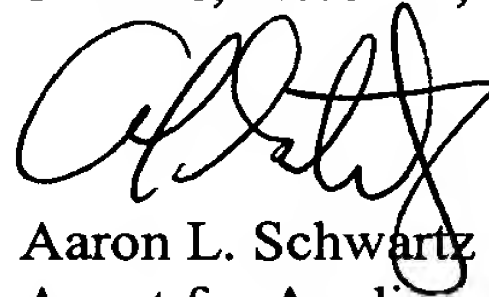
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will

expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Version with markings to show changes made

In the Claims:

Claim 1 has been amended as follows:

1. (Twice amended) A method for denaturing or separating double-stranded nucleic acid molecules, said method comprising
 - i) contacting one or more double-stranded nucleic acid molecules with a denaturant selected from the group consisting of
 - a) one or more amino acid denaturants,
 - b) imidazole, and
 - c) one or more amino acid denaturants plus imidazole,thereby forming one or more single-stranded nucleic acid molecules[, with the proviso that said denaturant is not selected from the group consisting of asparagine and β -alanine]; and
 - ii) combining said one or more single-stranded nucleic acid molecules with one or more nucleic acid molecules wherein said one or more nucleic acid molecules are capable of hybridizing to said single-stranded nucleic acid molecules.